Supporting Information

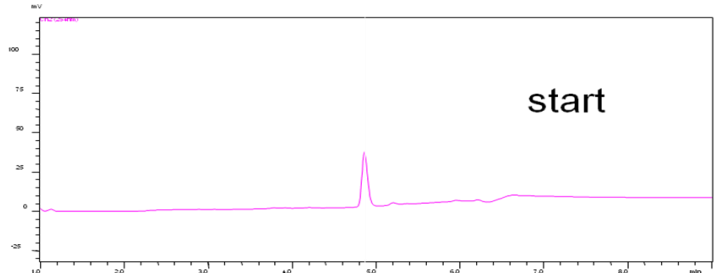
Materials and general methods:

Chemicals materials: Taxol were purchased from Baoman Biotechnology (Shanghai), Succinic acid was come from Alfa Aesar. We bought the hyaluronic acid from Aladdin. Chemical reagents and solvents were used as received from commercial sources. Commercially available reagents and solvents were used without further purification, unless noted otherwise.

General methods: ^{1}H NMR (Bruker ARX 400) was used to characterize the synthesized compounds. Conversion and drug release of succinated dexamethasone was carried out by a LCMS-20AD (Shimadzu) system. TEM was performed at the Tecnai G2 F20 system, operating at 100 kV. Rheology test was done on an AR 2000ex (TA instrument) system, 40 mm parallel plates was used during the experiment at the gap of 500 μm.

Preparation of Succinated Taxol: Taxol (854 mg, 1 mmol) and succinic anhydride (100 mg, 3 mmol) were dissolved in pyridine (20 mL) and stirred at room temperature for 3 h. Then the solution was removed and ice water (70 mL) was added, after a 20 min of quiesequence, the mixsture was placed on ice statically. Finally, the fine crystals were collected through centrifuging and lyophilized by lyophilizer.[1, 2]

Formation of hydrogel: 2 mg of compond was dissolved in 0.15 mL of PBS buffer solution containing 1, 1.1, 1.3, 1.4 equiv. of Na_2CO_3, and 0%, 10%, 30%, 60% wt HA to taxol-succ was added into respectively. (1 equiv. of Na_2CO_3 were used to neutralize the compounds and the additional Na_2CO_3 were used to neutralize HA to make the final pH value to 7.4), a gel was formed upon keeping at room temperature or at 37 ^{0}C for more than 12h or they changed to a gel immediately after 30s sonication .



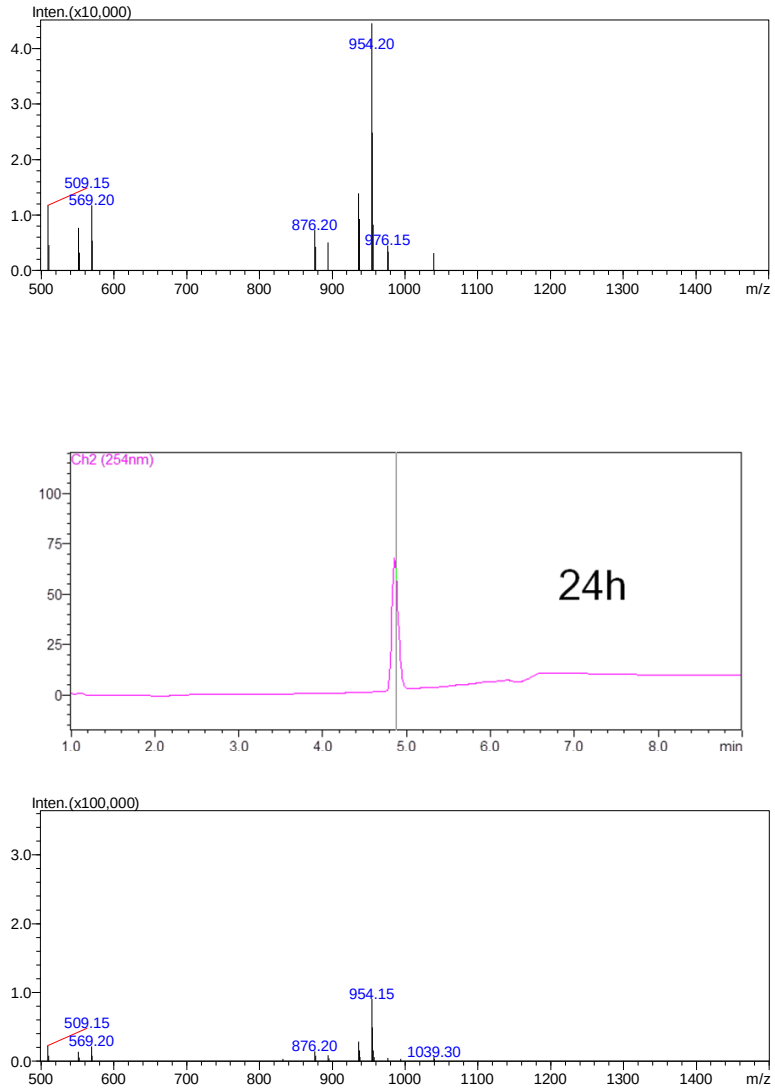


Fig. S-1. The Lc-Ms of hydrolysis of **Succinated Taxol** at 0 h and 24 h

Drug release: Make a hydrogel formation from PBS solutions containing 1wt% of succinated taxol itself , with 10%, 30%, 60%wt to taxol-succ respectively in PBS (PH=7.4) in EP tube at 37^0C. we added 0.25 mL of PBS on the surface of the hydrogels, 0.2 mL solution was taken out at the desired time point and 0.2 mL PBS was added back. For the following time points, 0.2 mL of PBS was taken out and 0.2 mL of PBS was added back at each point. After 24 h, We then monitored the release profile from the gel formed at 24 h at 37 ^{0}C by a LCMS-20AD (Shimadzu) system.

Rheology: Rheology test was done on an AR 2000ex (TA instrument) system, 40 mm parallel plates was used during the experiment at the gap of 500μm. For the dynamic time sweep, the solution of compounds were directly transferred to the rheometer and it was conducted at the frequency of 1 rad/s and the strain of 1% after 12h. The gels were also characterized by the mode of dynamic frequency sweep in the region of

0.1-100 rad/s at the strain of 1%.

Tumor inhibition assay: Aiming to build breast tumor model, we inoculated Female Balb/c mice with 2×10^5 4T1-luciferase cells in the mammary fat pad. The tumor growth was monitored every other day. Tumor volume was recieved through calculating by the formula: length × width × (Length + Width)/2. When tumors size reached ~30 mm^3, mice were randomly divided into different treatment groups. The day of giving drugs was designated as day 0. Mice weight was also monitored after receiving treatment.

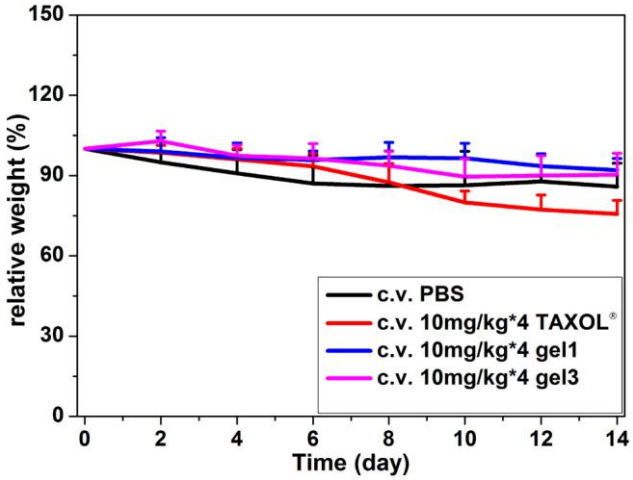


Fig. S-2. In vivo toxicity performance of our hydrogels at different dosages compared with PBS and Taxol®.

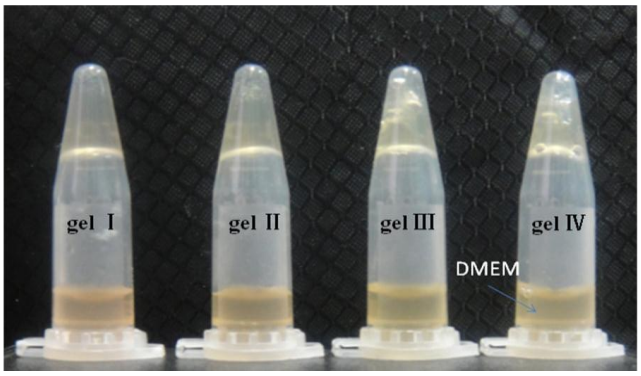


Fig. S-3. Optical images of gels after being soaked with the DMEM containing 10% of FBS for 48h.

Reference:

1. H. M. Deutsch, J. A. Glinski, M. Hernandez, R. D. Haugwitz, V. L. Narayanan, M. Suffness, and L. H. Zalkow, *J. Med. Chem.*, 1989, **32**, 788-792.
2. Y. Gao, Y. Kuang, Z.-F. Guo, Z. Guo, I. J. Krauss, and B. Xu, *J. Am. Chem. Soc.*, 2009, **131**, 13576-13577.